The Scientific Review,

AND

SCIENTIFIC AND LITERARY REVIEW,

A RECORD OF PROGRESS IN ARTS, INDUSTRY, AND MANUFACTURES,

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SUBJECT MATTER INDEX OF APPLICATIONS FOR PATENTS.

Feb. 21st to March 20th inclusive.

The following Index gives first the class, then the name of the Inventor, and Ne. of the application. In this list (com.) means Invention communicated from abroad. Further information as to the progress of these Patents by Notice to Proceed, Sealing, and Specifying, can be obtained at the Office, 21, Cockspur Street, Charing-cross.

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Printing and Transferring: Type and other Surfaces for Printing, Composing, and Distributing Type.—J. Sachs, 1166. E. A. Brydges (com.), 1260. J. Imray, (com.), 1297. W. A. Barlow (com.), 1316. H. Mathieson, 1322.

Propelling Carriages &c.—G. F. Redfern (com.), 1130.

Propelling Machinery, Transmitting Power and Motion, Converting Movements.—J. Dobney, 844. W. R. Lake (com.), 896. G. Asplen, 988. J. Thomson, 1138.

Propelling Ships, Propellers, Paddle-wheels and Screws.—T. Lambert, 859. T. Heppell, 878. J. Cooke, 992. J. E. Monland, 1073. W. T. Lithgon, 1226. J. Wills, 1341.

Pulleys.—W. Meakin, 847.

Pumps, Pumping and Forcing Liquids, Pumping and Raising Water and other Liquids, Pumps, Pistons, and Packing.—H. E. Newton (com.), 924. H. Davey, 1028. H. Gardner (com.), 1038. A. W. Harrison, 1143. G. V. Fosberg, 1234.

Rags &c.—G. Rydill, 1339.

Railway and other Buffers.—E. Clarke, 1239.

Railways, Carriages, Coupling, Uncoupling, and Altering Positions of Carriage and Engines.—W. A. Turnbull, 938. C. Sharpley, 982. G. Haycroit, 991. J. C. Carmalt (com.), 1196. A. J. Boult (com.), 1335.

Railway, Permanent Way, Rail Joints, Chairs and Sleepers, Portable Railways, Atmospheric Railways, Switches, Points, Crossings, and Turn-tables.—A. M. Clark (com.), 854. C. N. Leroy, 963. A. Davey, 1003. G. N. Minchin and L. H. Despressis, 1010. J. D. Mewburn (com.), 1168. J. Todd, 1251. W. Stroudley, 1263.

Reaping and Mowing. &c.—J. Harrison, 852. A. M. Clark (com.), 1080. H. R. Allen (com.), 1110. H. R. Allen, 1111. J. S. Macgregor and G. Redfearn, 1152.

Reflectors, &c.—F. H. F. Engel (com.), 849. J. R. Smith and J. I. Learoyd, 887. H. J. Haddan (com.), 917. P. Molloy, 948.

Refrigerating and Freezing, Cooling Liquids Making Ices, &c.—W. Ode Wit (com.), 890. C. D. Abel (com.), 954.

Registering. &c.—M. Levy and F. Lowe, 868. J. J. Royle, 927. A. Akeroyd, 930. G. F. Redfern (com.), 990. H. Davey, 1028. H. J. Haddan (com.), 1126. J. P. Nolan, 1309. F. Dening, 1321. H. T. Davis, 1352.

Respirators.—O. Y. Rhodes, 1180.

Roads, Paths, &c.—J. R. Nottingham (com.) 975. W. Brass, 1015. J. T. Todd, 1251.

Rods and Bars.—R. Elliott, 846.

Ropes, &c.—H. J. Haddan (com.), 902. E. A. Lietzman and O. Borchardt, 1313.

Rugs, &c.—G. Rydill, 1339.

Safes, &c.—W. P. Thompson (com.), 1195.

Sewing and Embroidering.—R. H. Brandon (com.), 996. W. R. Lake (com.), 1192. W. Hollingsworth, 1240.

Shears, &c.—T. Brown, 1043.

Ships and Boats, &c.—J H. Clasper, 962. H. H. Lake (com.). 1009. J. P. Wright, 1056. J. E. Mouland, 1073. A. Whittall, 1081. W. R. Lake (com.), 1106, J. Shields, 1112. F. Lebray, 1125. A. W. Lake (com.), 1229.

Salt, &c.—G. S. Hazlehurst, 509.

Samples, &c.—T. Whetstone, 403.

Scents, &c.—W. Edge, 483.

Scrapers.—J. S. Willway, 671.

Screens.—H. J. Davis, 701.

Screws, Screw Drivers, &c.—F. Wirth (com.),

Shirts, Collars, &c.—C. Tighe, 670.

Sifting, Sorting, and Separating, &c.—W.

Signs, &c.—W. Carter, 364. A. Ashwell,

Slabs, &c.—G, Otway, 544.

Spades, &c.—T. Brown, 780.

Soundings, &c.—C. A. McEvoy, 358.

Spindles and Flyers.—T. Watson, 304. W.

Spittoons.—J. Clark, 369.

Ships' Boats.—Mr. Bulow, 1053.

Ships' Cargoes (Loading, &c.)—W. Blythe. 1022.

Ships' Logs.—T. Davison, 871. F. Webster, (com.), 1004.

Showcases, &c.—C. D. Abel (com.) 1151.

Signals, &c.—H. Lees, 877. C. Spratt, 880. P. Sykes, 946. C. N. Leroy, 963. T. W. and W. Brierley, 973. T. Gaddes. 1134. C. B. Wood, 1207. W. Stroudley, 1263. J. Natt, 1283. D. Brenmer, 1345.

Sizing. &c.—J. Coulong, 1286.

Soap, &c.—E. S. Loxton, 1227.

Sowing Seeds.—H. A. Bonneville (com.), 1064.

Spinning, &c.—W. R. Lake (com.), 881. T. Crabtree, 932. S. Brooks and A. Holden, 998. T. Watson, 1016. J. Dobson, 1141. W. T. Watts, 1311.

Springs.—L. A. Groth (com.), 857. J. T. Bennett, 966.

Steam and other Boilers, Cleaning and Preventing Incrustation of Boilers, Water Feeding Apparatus for Boilers.—F. J. Rowan, 815. J. Forsyth, 865. J. J. Royle, 927. W. Brierley and M. Mitchell, 1040. J. Ripley and T. Scholes, 1074. C. Kingsford, 1078. H. J. Haddan (com.), 1202. C. W. Wardle, 1205. R. Davidson, 1267.

Steam Engines (Stationary, Locomotive, and Marine.)—B. Asplen, 988. W. Jones, 1187. J. Hopwood, 1244.

Steering and Guiding.—T. F. Walker, 964. J. Cooke, 992. W. Pepper, 1129.

Stone, &c.—W. Simmons, 1306.

Strontium.—J. G. Tongue (com.), 1014.

Stuffing Boxes and Glands, &c.—H. J. Haddan (com.), 944.

Sugar and Syrups, Glucose.—H. J. Haddan (com.), 902. W. R. Lake (com.) 995. H. H. Lake (com.), 1055. C. Scheibler, 1057. S. Pitt (com.), 1185.

Surgery, &c.—G. E. Vaughan (com.), 957.

Swimming.—C. D. Abel (com.), 1032.

Tablecovers, &c.—G. Rydill, 1339.

Tapestry.—A. J. Boult (com.) 1033.

Telegraphs; Telegraph Printing Apparatus.—J. C. Mewburn (com.), 866. M. Volk, 879. A. F. H. George, 922. J. S. Lewis, 1217. J. Rapieff, 1020. L. E. Irish, 1024. R. and M. Theiler, 1044. N. C. Cherrill, 1054. G. Smith, 1132. S. Pitt, (com.), 1136. W. H. Davies and F. A. W. Higgins, 1137. J. D. Husbands, 1177. A. W. Rose 1271. P. M. Justice (com.), 1303.

Thrashing Machines, Reaping Machines—H. W. Walden, 1304.

Tickets, Labels, &c.—S. Arnold, 1253.

Tilling and Cultivating, &c.—R. W. Ralph and W. S. Underill, 1093.

Tobacco and Snuff, Cigars, Cigar-Holders, Pipe and Cigar-lighters, Smoking Pipes, Tobacco Pouches, &c.—H. J. Haddan (com.), 1278.

Tramways, &c.—G. Smith, 1132.

Traps for Drains, &c.—R. Pearson, 1113. C. Slagg, 1326.

Umbrellas, Parasols, &c.—A. C. Henderson (com.), 1049.

Urinals, &c.—S. S. Hellyer, 914. C. Rubens, 1272.

Valves, Taps, Stop Cocks, Plugs; Regulating the Flow and Pressure of Fluids.—J. E. Chambers, 940. S. B. Goslin, 1006. W. Weissenbach, 1050. J. Rawson, 1128. A. W. Harrison, 1140. W. Jones, 1187. J. Hopwood, 1244.

Velocipedes.—C. Edwards, 845. J. Humpage, 848. H. Lees, 877. S. Fry, 1001. G. Singer and R. H. Lea, 1018. T. H. Ward, 1052. A. Whittall, 1081. J. M. Taylor and G. Hether, 1028. H. D. Miller, 1275.

Washing, &c.—W. R. Lake (com.), 908. J. and W. McNaught, 983. R. Wallwork, 1087.

Washing Minerals &c.—H. J. Allison, 879.

Water-Closets, &c.—J. Rawson, 1123.

Water-Power Engines, &c.—F. Pool, 1115.

Wearing Apparel, &c.—A. M. Clark (com.), 993.

Weaving, Braiding, Plaiting, Preparing for Weaving, &c.—J. Shorrock, 935. J. Singleton, 1008. E. O. Taylor and T. Brierley, 1090. D. Bailey, 1091. C. H. Clegg and E. Hoyle, 1102. G. Burslem, 1118. L. Greenwood, 1250. J. Carr, 1259, T. Knowles, 1273. R. Bailey, W. Walker, and L. J. Crossley, 1329. A. M. Clark (com.), 1337. A. Priestman and J. Ackroyd, 1350.

Weighing, &c.—J. Royle, 927.

Wheels for Carriages, &c.—J. Mackay, 1147. J. Haynes, 1331.

Wheels for Machinery. &c.—W. R. Lake (com.), 896.

Window Blinds and Sashes.—J. Everard, 850. J. Wetherell, 1065.

Wire, Wire Working, &c.—M. Evans, 1225.

⁂ *The above List is prepared from the Patent Records by Mr. T. Morgan, Secretary of the Inventors' Patentright Association, Limited.*

PRESERVATION OF IRON.

A novel way of preserving the surfaces of iron has just been discovered. The treatment is as follows:—The iron is subjected to the action of diluted hydrochloric acid, which dissolves the iron, and leaves on the surface a pellicle of homogeneous graphite, which adheres well to the surface of the iron. The piece to be preserved is next treated, in a hydraulically closed receiver, by hot or cold water, or, better, by steam, in such a manner as to completely dissolve and remove the chloride of iron formed. Finally the piece of iron is left to dry in the receiver, from which all liquid has been removed. A solution of caoutchouc, gutta percha, or gum resin in essence of petroleum is then injected. On the essence being evaporated, there remains a solid enamel-like coat on the surface of the iron. Instead of privately eliminating the iron salt, it may be utilised in forming a kind of vitreous enamel. For this purpose the iron is immersed, after treatment with the acid, in a bath of silicate and borate of soda. A very pure and brilliant silico-borate of iron is formed, which closes up the pores of the metal. As to the disengaged chlorine, it combines with the free soda, forming chloride of sodium, which remains dissolved in the liquid. Thus the important question of the preservation of iron appears to have been brought another step toward solution.

Reviews.

NATAL IN ITS RELATION TO SOUTH AFRICA.

"Natal in its Relaton to South Africa." A Paper read before the Royal Colonial Institute. By James R. Saunders., M.L.C. Natal. London: S. W. Silver and Co., Sun Court, 67, Cornhill. 1882.

This professes to show that the wars which spread all round Natal after 1874 were wars with which the colony had nothing to do, though it had continually warned the home authorities of the result of yielding to the influences which were directing its policy. In truth, Natal was the only colony whose natives remained loyal, and it only became exposed from the accident of its position, which made it the base of those military operations which commenced before Sir Bartle Frere reached South Africa. During these years the few Colonists of Natal contributed from the revenue so large a sum for war and defence that, if a similar expenditure were incurred by the British nation in proportion to its population, it would exceed its National Debt. The loss of life of Colonists, in similar ratio, was such that the destruction of the entire British army would not be larger; whilst its volunteer levies will bear a fair conparison with any forced conscription in Europe, as is shown by the large number of war medals distributed—for which, by-the-bye, the colony was made to pay.

My subject, says the author, "Natal in its Relation to South Africa," takes us back to the great migration of Dutch farmers from the Cape in 1835, to their wanderings through the wild lands of the Free State till they reached Natal; for which Lieutenant Farewell settled near Durban in 1822, and, after his murder Fynn and others assumed the chieftainship for a few years—though it was only proclaimed a British Colony in 1843—the first real practical settlement was that made in 1838 by Retief and the Dutch farmers.

In the varied details I shall refer to, my main object will be to make them bear on the question of broad policy which directs events; and to the proper understanding of what those influences were which controlled their rules during the last half-century of war, so as to discover a guide for the future by the exposure of the past.

These views appear to be carefully worked out in this paper, to the reprint of which, from the *Colonial Review*, we must refer our readers.

THE STUDY OF TRANCE, MUSCLE-READING, &c.

"The Study of Trance, Muscle-Reading, and Allied Nervous Phenomena in Europe and America, with a Letter on the Moral Character of Trance Subjects, and a Defence of Dr. Charcot." By George M. Beard, A.M., M.D., Fellow of the New York Academy of Medicine: Member of the American Neurological Society; of the American Academy of Medicine; Author of Neurasthenia, American Nervousness, &c. New York. 1882.

This little work is incapable of being dealt with as a critical review, but it is explained in the preface that the following narratives and analyses of facts relating to the investigation of important and interesting phenomena of the nervous system are published in the belief that they will be new, in whole or in part, to the majority of neurologists and practitioners, both in Europe and America.

Some of the facts connected with the detailed history of muscle-reading are here put on permanent record for the first time, and have been obtained partly from memory and partly from public and private documents in my possession.

It is interesting and incredible that these phenomena of the involuntary life which, during the past year, have been exciting so much inquiry in the neurological world, even so recently as 1874 were almost entirely without an audience.

It is just to remind students of these topics, who are comparing the earlier and later researches, that all the leading problems connected with the nature and phenomena of Trance were solved and the whole subject organised in a science by Mr. Braid and myself, years before the recent French and German experiments were inaugurated. His own special task, Mr. George M. Beard states, was to take up the subject where Mr. Braid left it and bring it out of the territorial into the organised stage. This task was substantially accomplished in the monograph published in 1877, and which is referred to in the work.

Correspondence.

PERPETUAL MOTION.

TO THE EDITOR OF THE SCIENTIFIC AND SCIENTIFIC AND LITERARY REVIEW.

SIR,—Are there those amongst the readers of the SCIENTIFIC REVIEW who would be kind enough to give a definition of "Perpetual Motion?"

Is it the principle of perpetual motion which is not known, or is it the application of a known principle in which the difficulty lies? I believe that I am in possession of the knowledge as regards the principle, and should my supposition prove correct, I think that the difficulty of application could be cleared away in course of time. I hope at some future time to be in possession of facts which will set the whole matter at rest, but as it of necessity entails some expense which it is a matter of time to defray, I have been unable to make that speedy progress in my experiments which I should wish. My calculations respecting both principle and application are, to a great extent, perfect. All opinions would be much valued.

Please address all communications, by post only, to "S," care of F. J. Hyde, 21, Webb Street, Stapleton Road, Bristol.

RECENT AMERICAN AND FOREIGN PATENTS.

An *improved rocking grate*, especially applicable to locomotive engines, and designed to prevent ice from collecting on the under side of the grate when the engine is running through snow, has been patented by Mr. John R. Fish, of Grand Rapids, Mich. The invention consists in a combination, in a rocking grate, of bars arched from their ends to their centres with bars which are straight on both their upper and lower faces, each and all of the several bars being journaled and formed with vertical parallel ribs on their sides, and preferably provided with depending legs connected with a shaker bar arranged to extend through the ash pan. The crowns of the arched bars, which alternate with the straight bars, extend considerably above the upper faces of the latter, thus exposing the arched bars to a high degree of heat, which prevents the accumulation of snow and formation of ice thereon. A free passage for air between the bars is insured, fine coal may be burned on the grate, and the latter be readily rocked.

An *improvement in machines for the manufacture of ice*, which is both economical and gives a large working capacity, has been patented by Mr. Charles W. Gelett, of Oakland, Cal. This invention relates to that part of an ice machine known as the "congealer;" and it consists of a thin, hollow, rectangular plate having stops at intervals between the two freezing surfaces, so that the flow of the refrigerant will meet with more or less impediment in passing through the plate, and a more rapid congelation of the water which is directed upon the outside of the plates will take place. These stops are preferably arranged in rows, the stops of each row being at an angle of forty-five degrees to those of the next row, thus keeping up a more thorough agitation of the refrigerating vapour and insuring its contact with the entire side surfaces of the congealer. Any number of such congealers are so arranged within a frame and combined with the gas or vapor reservoir, air pump, pipes, and water-spraying devices of the machine, that ice is formed upon both sides of said congealers.

Mr. Hans J. Muller, of New York city, has patented an improved *ore separator*. The object of this invention is to provide a new and improved device for separating particles of iron, steel, &c., from granulated or pulverised ore or other material. In this apparatus the pulverised material is placed in a hopper and dropped from there upon a platform or shelf which is vibrated by a ratchet wheel, fast on the shaft of a rotating magnetized cylinder, and engaging with a lever, on the shaft of which is an arm that connects with the shelf. The sand or granulated material slides down said shelf, which is slightly inclined. The particles of iron or steel cling to the cylinder and are scraped from the same by a plate, and drop into a slot or into a receptacle below it, while the particles of sand or granulated material drop from the edge of the shelf into another slot or receptacle beneath it. The apparatus, although simple, is effective.

Mr. James B. Gillham, of Merritt, Ill., has patented an improved *car coupling*. This invention pertains to self-couplers; and it consists of a drawhead having tongues projecting rearward into corresponding sockets or slots in the drawbar and carrying springs on their ends, and provided, also, with a square collar fitting over the end of the drawbar, said tongues having vertical perforations corresponding with the openings in the drawbar for the reception of the coupling pin, which latter, when coupling, holds both drawhead and coupling link in position; and it further consists of a coupling pin reduced near its point and having a conical extremity for use in connection with the drawhead and drawbar constructed as above, whereby the pin is prevented from being too far withdrawn and the drawhead is retained in position. The pin may be uncoupled, and held when disengaged by an attached rod reaching above the top of the car and capable of suspension on a pin projecting from the front of the car. The invention is an ingenious one.

Mr. Justin J. Langles, of New Orleans, La., has patented a simple but useful adjunct to *show boxes*. The object of this invention is to provide an ornamental and removable cover for grocery and other boxes, which, while exposing the contents of the box to view, shall be preservative of its contents, and is provided with a lid that may be automatically held open at any point. The invention comprises a frame, which is preferably made of ornamental wood, constructed to fit over and receive within it the upper edges of the box, and provided with inside strips which support the frame upon the top of the box. A lid, which may be also of ornamental wood and has a glass top, is attached to the frame by hinges formed of angular plates which bind the corners of the lid and frame. Pivoted to this lid is an arm, and pivoted to one of the side bars of the frame is a slotted plate, through which said arm passes at an angle, that causes the plate to act as a clutch upon the downward movement of the arm, except when specially relieved, but permits of a free upward movement of the arm when raising the lid.

A cattle car of decidedly novel and useful construction, has been patented by Mr. Walter I. Tinkham, of Taunton, Mass. The object of this invention is to facilitate the loading, unloading, feeding and watering of cattle and other animals while being transported. The roof of the car is perforated, preferably by constructing it with a central longitudinal slot, and is made inclining downwardly toward said opening, and beneath the roof a tank is arranged. This construction provides for receiving and carrying a supply of water for the cattle. The water may be drawn from the tank into troughs made capable of being raised and lowered, and, if necessary, provided with upper boxes for holding feed. The door of the car, which is somewhat longer than the height of the car body, has cross cleats on its outer surface, and is fitted to freely slide up and down on rods in such a manner that, when lowered, it may be inclined and made to serve as a gang plank.

An Improved Oil-press Mat, in which outer wooden leaves lined with wire cloth, and connected by a flexible joint, are combined with one or more middle leaves of wire cloth, secured to said joint, has been patented by Mr. George O. Baker, of Selma, Ala. In using this mat the meal or seed bags are placed between the leaves or aprons in the usual manner. As soon as pressure is applied the wire cloth takes hold by its meshes on the bags, thus effectually holding the bags in place and insuring the even distribution of the seed or meal. The wire cloth also allows free escape of the oil from the bags and out of the mats. This mat can be readily and cheaply manufactured, and possesses great strength and elasticity.

Mr. Isaacs B. Potts, of Columbus, Ohio, has patented an improved *pipe wrench*, consisting of a handle provided with the inclined and serrated stationary jaw at its outer end and the natches on its under side, in combination with a yoke or saddle and movable jaw secured at each end to the said yoke or saddle, and provided with a lip, and the serrated face inclined in an opposite direction to that of the jaw.

Mr. William H. Bryan, of Warm Springs, Va., has patented an improved *packet for transporting eggs*. In this packet the eggs are carried in boxes mounted one upon another within compartments of a wooden case, which is fitted with a spring-supported false bottom. Each of these boxes is constructed with elastic upright partitions formed by doubling a strip of metal upon itself and springing the two walls of the partition apart at the centre. These partitions are secured in the box at right angles to each other, and have their ends passed over to the outer surface of the box. They are arranged so that the eggs are kept from contact one with another, and the top and bottom of the box are cushioned. This construction is very simple and secure against breakage of the eggs.

An improved *side-bar vehicle* has been patented by Mr. Lafayette A. Melburn, of Denver, Col. The invention consists in a certain improvement in the class of side-bar vehicles, more particularly in buggies, which are constructed upon what is commonly termed the "Brewster" pattern. The springs that support the bodies of such buggies require to be made very stiff in order to have the requisite strength, and, being also short, they lack that degree of elasticity necessary to render the vehicle comfortable to the occupant when passing over ordinary roads. In attempts heretofore made to remedy this defect various so-called improvements have been made in the form and arrangement of the springs, but without the desired success, since the result has been a noticeable, if not striking, inelegance of appearance, and considerable addition to the cost and complication of structure of the buggy, besides lessened efficiency in use. This inventor has devised an improvement in the form and arrangement of the springs which overcomes the defect of the Brewster.

PROPOSED PATENT LEGISLATION IN THE UNITED STATES.

SEVERAL Bills of general interest to patentees are, according to the *Scientific American*, now awaiting action by the Committee on Patents.

Senate Bill No. 1,226 introduced by Mr. Call, February 16, proposes to introduce a novel and questionable practice designed to limit the rights of owners of extended patents. It provides that when letters patent for a valuable invention have been extended, owing to the failure of the patentee to receive reasonable compensation for his invention in consequence of poverty and inability to manufacture and introduce his invention, the extended patent shall not give any right to the exclusive manufacture and sale of the invention. The manufacture and sale must be open to the public, subject only to the payment, to the inventor, of a royalty not exceeding for the first year a net amount of 20 per centum on the cost of the materials used in the manufacture of the article, and diminishing in a regular ratio each successive year during the life of the patent.

The Bill further provides that in all cases where letters patent shall be extended under the provisions of the act, the Commissioner of Patents shall advertise the application for the space of three months in some newspaper of general circulation, and a hearing be given to all persons objecting to the extension; the applicant is allowed the right of appeal to the District Court of the United States for the District of Columbia, on giving bond for cost. The cost of the advertisement is to be paid by the Inventor if he is able; if not it is to be paid out of the fund subject to the control of the Commissioner of Patents, and remain a lien in favour of the government on the patent until the same is paid.

A Bill introduced by Mr, Platt, February 17 (S. 1,238), to regulate practice in suits for infringement where the purchase is made in good faith for the defendant's personal use, provides that if the plaintiff does not recover twenty dollars or over he shall have to pay costs, unless the defendant had actual notice of the existence of the patent or disputes the plantiff's right to recover anything.

It further provides that when suit is brought against a defendant other than a manufacturer or seller the plaintiff shall first deposit with the clerk of the court the sum of fifty dollars as security for the costs and expenses of the defendant. In case the defendant prevails the deposit (or a "reasonable" part of it) is to be allowed by the court for counsel to the defendant, and the plaintiff will have to pay the costs in addition.

The obvious purpose of this Bill is to repress suits against actually or suspected infringing users of patented inventions; and while it may be calculated to prevent certain alleged abuses its discrimination against patentees of small inventions is certainly not in harmony with the general spirit of the patent laws.

In the House Mr. Skinner introduced, February 13, a Bill to limit the reissue of patents (H. R. 4,353). It forbids the reissue of patents except within three months of the issue of the patent in all new cases, and within three months of the passage of the proposed act in case of all patents already in existence.

The principle of limiting the period during which a patent may be surrendered for reissue is good; but it may reasonably be questioned whether a three months' limit is not too brief.

A Bill introduced by Mr. Vance, February 20 (H. R. 4,573), makes it the duty of the Attorney-General to take legal proceedings in equity in the Supreme Court of the District of Columbia to secure the annulling of any patent which he has ground for believing to have been procured by fraud or misrepresentation. In case the party at whose complaint the proceeding is begun fails to establish the invalidity of the patent he will have to pay the costs incurred by the Attorney General in the litigation.

THE DESIGN OF STRUCTURES TO RESIST WIND-PRESSURE.

By CHAS. B. BENDER.

THE following paper was read at the meeting of the Institution of Civil Engineers on Tuesday, the 14th of March:—

It was observed that wind-pressure was as often overrated as underrated. Instruments to measure the velocity and force of the wind were not very reliable, on account of the frequent change of direction of the wind, and of its action by sudden gusts, and not by mere statical pressure. The most trustworthy experiments, made with plates by General Didion, yielded pressures of 40 lbs. per square foot on a test plate having an area of 10·76 square feet, for a velocity of 111 miles per hour. The size of the test plate was very material. Had Didion used plates 12 inches square, the pressure would have been only 32 lbs. The form of surface exposed to the wind was also of importance. Hollow cups experienced double pressures, cylinders only one-half of the test-pressure, and there were forms which reduced it to less than one-fourth of that on a flat plate. Since hurricanes generally acted with great lifting power, in calculating the wind-pressure upon a structure, the most dangerous direction of the wind must be considered. For bridge-floors, wind coming from below at an angle of about 25° was the most trying. Now, assuming the wind to blow in this direction, and a little from the side, the total opposing surface of a structure, having regard to the size, position, and form of its members, and, in the case of railway bridges, carrying a light passenger train on the floor, must be considered. Engineering structures must be so built that there should not be any movement, either of shifting, turning on a pivot, or tilting of the whole structure. Further, lateral and transverse wind-bracing must not be strained beyond one-third of the calculated breaking strain. Since the horizontal wind-bracing might experience strains from the vertical loads, those strains must be deducted from the specified maximum; and it would be found that for short spans there would remain available for wind proper, five tons, and for large railway bridges, six tons per square inch of lateral wind-diagonals. The transverse bracing might be influenced by the vertical loads, and it must likewise be designed to stand strains arising both from wind and from moving loads. The wind-pressure of the top lateral bracing of the bridge had to be carried to the lower floor, and each end must be sufficiently strong and stiff. As regarded details, it was essential to provide strong plates or pins for joint connections, so as to absorb additional or secondary strains upon the members. In the case of eccentric connections, the moments of flexure arising from the application of forces must not be neglected, and there should be members strong enough to transfer the wind-strains to the central joint. Iron piers, also long-span bridges, must be carefully examined as regarded tilting, and the danger must be met by giving a sufficient base, or by anchoring to heavy blocks of masonry, well proportioned and well executed, or by both of these methods. The consideration of the action of wind materially influenced the proportion of the width of a bridge to its depth, and the latter was limited long before the maximum height was reached, as regarded vertical loads, in a bridge of most economical design. For instance, in a girder-bridge of 400 feet span and 18 feet wide, the truss could not with safety be deeper than 45 feet; if built 50 feet deep, a width of 21 feet was advisable. As the force of the wind upon a large railway bridge amounted to about the load of an ordinary train, it followed that its design for carrying vertical loads was only part of the problem to be solved. Bridges and similar structures, if equally well designed in both directions, horizontal as well as vertical, were satisfactory, and they would not be so unless this was done.

THE PURIFICATION OF WATER.

A METHOD of purifying water which bids fair to place dyers, calico printers, bleachers, paper and other manufactureers, and public water boards (who have now only a supply of inferior discoloured water) practically in the position of those who have a first-class source of supply has, after numerous investigations and experiments, been developed into a practical process by Mr. Peter Spence, of the Pendleton Alum Works, and has during some time been tested on a very large scale at the waterworks of the Bolton Corporation. The character of the Bolton water as supplied to the rate-payers, outlying local boards, and manufacturers (compensation) is only too well known in the district. It contains a proportion of micaceous clay in such a peculiar state of suspension that neither filtration nor long settlement in reservoirs will remove its dirty opaque tint; probably no water, therefore, could have put the process to a more severe test. The trial referred to has been made at the Heaton reservoir, one of the two service reservoirs supplying Bolton and district; the other, the Sweetlove's reservoirs, has been left untouched. The result of the trial is that, whereas the latter contains a mass of water which, upon being looked at through the two-feet tube, over white paper, would be pronounced unfit for human being to drink, the Heaton reservoir now contains some sixty million gallons which is beautifully transparent and colourless, and has, in fact, a much finer appearance than the Manchester water. It may be added that this result has been achieved without hardening the water or introducing any new constituent into it (the iron naturally present is, in fact, removed by the process—a most important point for dyers and printers), or without in any way affecting the fish in the reservoir; and the cost of treatment so far has been proved not to exceed one halfpenny per head per annum of the population. The Bolton Waterworks Committee have shown commendable enterprise in affording an opportunity for testing the process upon so large a scale, as they had incurred great expense in connection with a bill for parliamentary powers to borrow a large amount of money for filtering operations. They had also with this process to face the serious difficulty in he eyes of water engineers that the clay precipitated by it would be deposited at the bottom of their service reservoirs. Their venture has now been rewarded by the gratifying discovery that filtration has been proved an unnecessary and useless expense, and that at the least favourable estimate it would be some 52½ years before one foot of clay has accumulated at the bottom of their reservoir. In the case of Manchester water the impurity is mainly in solution rather than in suspension, the peaty matter giving the water, in the two-feet tube, the disagreeable yellow tint which is so conspicuous over the white tile flooring of the public baths, and which, because it prevents bathers knowing whether the water is really clean, doubtless deters many from patronising them.

According to the experiments of the distinguished sanitarian, Dr. Angus Smith, who is probably the greatest living authority upon the impurities of air and water, and who, we learn, has a high opinion of this new method of purification, the comparative results are: Distilled water, 33; Manchester water treated, 32; and Manchester water untreated, 14.

The Scientific Review

AND

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SIR DAVID BREWSTER, K.H., LL.D., F.R.S., &c., from the establishment of the INVENTORS' INSTITUTE, till his decease, February, 1868. LORD RICHARD GROSVENOR, M.P. Sir ANTONIO BRADY, till his decease, 1881.

SESSION 1881—1882.

MEMBERS' MEETING, April 27th, 1882.—W. C. Hughes, Esq., "On the Pamphengos Lamp, with Illustration."

Subscriptions are payable to Mr. G. A. STRETTON, the Receiver, 4, St. Martin's-place, S.W., who is the proper official to give receipts.

F. W. CAMPIN, Sec.

Proceedings of the Institute.

At the Executive Council nothing passed requiring publication.

At the Members' Meeting, 23rd March, 1882, the Paper on the Patent Law, by Mr. T. MORGAN, A.S.E., was read, Admiral SELWYN, V.P. presiding The Paper is given *in extenso* in another column.

Monthly Notices.

Fogs.—Mr. Newth, at the Physical Society on the 11th ult. showed experiments illustrative of the formation of fogs. The fact that burning sulphur, and even platinum wire rendered incandescent by an electric current, gave off solid particles in sufficient quantity to produce a fog, leads to the inference that even with gas stoves fogs will not be got rid of, though they may be of a lighter colour than those caused by coal fires.

Colouring Wines by the Aniline Compounds.—Dr. J. Nesler, who has been investigating them, states in *Biedermann's Central-Blatt fur Agrikultur Chemie* that he finds under certain circumstances the magenta used for colouring may so entirely disappear from wine as not to be capable of detection, or an upper stratum of the coloured wine may be free from this colouring matter, while it may still be found in the lower portion of the fluid.—*Athenæum.*

Iron Processes.—M. Seguin, of Paris, has patented a process for increasing the resistance of iron to tensile, torsile, and transverse strains. The metal is brought to a cherry-red heat and then plunged into a mixture of sulphuric acid of 60° strength, with an equal quantity of water. The iron is kept in the acid bath until its temperature is lowered to that of the liquid; it is then rapidly plunged into hot water.

MM. Brin have, *Les Mondes* informs us, greatly improved the manufacture of oxygen by Boussingault's process of peroxidizing and reoxidizing barium. This material after being used four hundred times was found not to be deteriorated. MM. Brin expect to be able to supply oxygen on a large scale at twelve to fifteen centimes per cubic mètre.

M. Clemadot at the Séance of the Academie des Sciences of March 13th communicated his new method of tempering steel and other metals, which promises to be exceedingly useful. The metal is brought to a cherry-red heat, and then strongly compressed, the pressure being maintained until the steel is quite cold. Metals thus treated acquire a great hardness, and when polished resemble nickel steel, retaining magnetism in a remarkable manner.

Professorship of Animal Morphology.—It is proposed to establish a professorship of Animal Morphology at Cambridge, to which Mr. F. M. Balfour, F.R.S., is to be nominated. Mr. Balfour's researches have, at the age of little over thirty, given him a place in the Council of the Royal Society and the presidency of the Cambridge Philosophical Society: he is also one of the general secretaries of the British Association. The Council of the Senate, in making this proposal, state that the School of Animal Morphology has been created in Cambridge by the efforts of Mr. Balfour, and has grown to its present importance through his ability as a teacher and his scientific reputation. A stipend of £300 a year has been proposed for the professorship, which may be terminated with the tenure of office of the first professor.

M. Dumas read before the Academie des Sciences on March 6th a paper "On the Normal Carbonic Acid of Atmospheric Air." He notices the defects of several methods of measurement, but commends the exactness of M. Reiset's method, confirming that chemist's results, that three volumes in ten thousand represent the general ratio of carbonic acid in the air.

Prof. Heeren's New Milk-Test.—This newly-invented instrument, the "pioscope," consists of a disc of black vulcanised caoutchouc, having in its middle a very flat, circular depression. A few drops of the milk in question, well mixed, are placed in the hollow and covered with the second part of the apparatus,—a plate of glass painted with six shades of colour radiating out from a small uncoloured circular spot in the middle. The colours range from white, grey, to deep bluish grey. The layer of milk is seen through the uncoloured spot in the centre, and its colour can thus be compared with the radiating colours, and its quality is judged according to the colour with which it coincides. Thus the whitest colour stands for cream, the next for very rich milk; then follow in succession—normal, inferior, poor, and very poor.

THE SCIENTIFIC REVIEW
AND
Scientific and Literary Review
INCORPORATING THE "JOURNAL OF THE INVENTORS' INSTITUTE."

APRIL, 1882.

THE PATENT LAWS AND PROPOSED AMENDMENTS THEREON.

At a meeting of the Inventors' Institute on March 23rd, 1882, Admiral J. H. Selwyn, Vice-President of the Institute, in the Chair, the following Paper on the above subject was read by Mr. T. Morgan :—

In appearing before you this evening on this subject, it is hardly necessary for me to say that it is one which this Institute has discussed over and over again, and to some of the Members present it is like travelling over an old path which, when the Institute was first established, was neither more nor less a path very difficult or even possible to travel; but this path by the efforts of the Institute has now been cleared, and in place of brambles and thorns we have one clearly defined and marked out and cleared of such impediments.

It would be idle for me to endeavour to go into the whole of the efforts by which this Institute has (by itself or in conjunction with other bodies), levelled, as it were, the wall in the way, and now where a few years back the Repeal of the Patent Laws was a question of the day, we find on all sides evidence that the fostering of the Inventiveness of the country does not as previously held tax the country, but adds to its prosperity.

Beginning with the commission appointed in 1865, when the bias of opinion was in favour of abolition, we find in 1874 the efforts of the Institute culminate in that important deputation received by the Lord Chancellor of the late Government, and the subsequent introduction of the Patent for Inventions Bill by him into the House of Lords. True nothing resulted during that Session, and the Bills that have been introduced in that and the succeeding Sessions have met a result similar to the first.

Each and every of these Government Bills have had the close attention of the Institute, but I think it would not conduce to the comfort of the members present for me to travel over the well-trodden path.

I may, however, remind you that immediately after the commission appointed in 1865, a Bill was drawn by the Council of the Institute which was termed the "Invention Right Bill." The great stride made during the past few years in fostering invention in foreign countries (especially in the United States), has evidently made a great impression, and if this country is to keep its place and compete with that country, it can only be effected by giving facilities to Inventors to bring forward their inventions and not allow them to be kept back by reason of the impossibility of Inventors securing their invention by imposing the exorbitant charges as at present. Workmen and mechanics are to a great extent the inventors and not the reapers from their inventions. I do not by this infer that some of them may not reap that reward which they are fairly entitled to, but as a general rule either those who advance the money are the gainers, or the public at large are the losers, in those cases where the Invention is withheld by the Inventor owing to the wall built up against him in the form of the enormous stamp duties demanded by Government.

Beside the Government Bills there has been introduced a Bill by Messrs. Anderson, Broadhurst, and others, which, although of simple construction, yet gives to the Inventor facilities not previously obtained. Whatever Bill is passed to be satisfactory it must be simple, cheap as to fees, and effective in its operation.

When I undertook to prepare this paper I was under the impression that the "Bill in a Box" which Mr. Chamberlain, President of the Board of Trade, has, would have ere this been introduced in the House of Commons, but matters of State calling for discussion I presume have interposed, and attention to home legislation been put on one side.

Two Bills, however, have been introduced in the House of Commons this Session. The first Bill is that introduced by Messrs. Anderson, Broadhurst, Palmer, and Brown.

In regard to this Bill, which is not yet printed, I saw Mr. Anderson a few evenings back and he informed me that there would be but little alteration in the body of the Bill, the only material alteration being that Clause IV. in last year's Bill would be more specific in its terms so as to define the functions of the Commissioners. Clause IV. runs thus:—

"It shall be the function of these three paid Commissioners to do all the duty hitherto performed by the unpaid Commissioners and the Law Officers, whose duties shall thereupon cease, to take over the establishment from them, and to manage all the business of the Patents for Inventions Office of the United Kingdom, and to perfect its organisation; more particularly in the matter of a library of records and registers, so indexed and arranged as to facilitate searches, and to be easily accessible to the public under such reasonable regulations and small fees as the Chief Commissioner with approval of the Lord Chancellor may from time to time prescribe."

There is, however, an addition to the Stamp Duties proposed which, although small, is decidedly a retrograde movement, for certainly the Inventor should not be taxed beyond that which will efficiently keep up the Patent Office. Seeing the amount of surplus accumulated funds extracted from unfortunate Inventors since the Act of 1852 came into force, I think that any excuse on the score of loss for the first year or so would not be a call for additional impost.

The other Bill introduced into the House of Commons is that prepared by the Society of Arts, and introduced by Sir J. Lubbock, Messrs. W. H. Smith and Lawrence, Q.C.

This Bill has been discussed very fully by various meetings, and I will simply confine myself to calling attention to a few of its provisions that I think require the attention of this meeting.

1. *Commissioners of Patents.*—There is to be according to this Bill three Commissioners, one experienced in Engineering, one in Chemistry, and one in Law. Now to my view I think if we are to have a board of Commissioners this one will be very incomplete. For surely these three Commissioners experienced in law, engineering, and chemistry will, as it were, be a sop in the pan to the number of inventions outside the domain of these Commissioners. Take as an instance the electric light and its applications which is now so much engrossing the attention of Inventors. A lawyer certainly should not be selected to sit in judgment, and as regards the engineer and chemist, although each may have some knowledge of the subject, yet it is not of that description that would command the confidence of Inventors in the various branches associated with electricity.

Examiners are to be appointed by these Commissioners, how many is not stated.

Application for Patent.—Provisional protection is the first step as now, but by subsection three it is proposed that should Patent be refused, or Sealing not be effected within time specified, the provisional specification shall be destroyed in the Patent Office; and until it is so destroyed its contents shall be kept secret. Inventors may naturally ask on this clause, why destroy, for if the papers are secret should certain formalities not be done, then the application will lapse. and in this case the Provisional Specification would not be published as it is now to the injury of Inventors and Patentees.

Power of Examiners.—The examiners are to report—

1. Whether the Invention is subject matter for a patent.
2. Whether the title of the invention sufficiently indicates its nature, and whether the Provisional Specification is in accordance with the title.

In looking at these two conditions I think the examiner is placed in rather an awkward position. We have in this room very often discussed matters regarding the first statement, and I think it is difficult to satisfactorily determino such a matter, especially as the examiner has only the title and the Provisional Specification before him.

The powers of the Examiner regarding the Provisional Specification remind me that almost the same is done at the present time by the so-called clerks for Patents, and for him to adjudicate on what may be termed the rough idea of an invention is unfair to Inventor should the Provisional Specification be objected to by the Examiner.

Final Specification.—This is to be filed not less than three months before the expiration of provisional protection, which is twelve months, but by this stipulation practically it is nine months. I think although we may be thankful for the three additional months at present given, yet it would be advisable to give the Inventor the full term of twelve months for him to lodge the Final.

The Final Specification is also referred to the Examiner, but there is one statement which I certainly consider should be struck out. It is to this effect :—

> "If the report of the Examiner on any question submitted to him is adverse to the applicant and is not appealed against, or is affirmed on appeal, the application may, nevertheless, be proceeded with, but in that event every Patent and every copy of the Patent if granted, and every copy of the Specification shall be endorsed with and shall bear on it a short statement of the report of the Examiner."

This is practically endorsing on the back of the Patent notice that it is bad, or practically so. This certainly is no encouragement or service to the Inventor.

The term of the Patent is to be seventeen years, but prolongation, on sufficient grounds being shown to the Commissioner, is allowed for a period not exceeding eleven years.

Mr. Anderson's Bill gives the term twenty-one years, and seeing in some countries twenty years is granted, I think it but fair that this term should at least be allowed, seeing under the present law the Privy Council has power to prolong a patent for fourteen years, thus giving twenty-eight years.

Museum and Library is to be provided. On this point I may be permitted to dwell on the existing Library and Museum. As regards the Museum, I think that nothing strong enough can be said against the so-called Museum at present existing. In fact it is not worth the name. If there was a Museum both in name and character that would reflect credit on the nation, what a boon it would be to Inventors at large!

As regards the Library, I think every credit is to be given to those in authority at that at present in existence; but this, from no fault of theirs, falls far short of what is required. One of the first questions with an Inventor is—Is my Invention new? He goes to his Agent, and he, of course, answers—That I cannot tell without searching. And even this he cannot guarantee. Inventor asks, Cannot I search? He can do so, and is informed of the Library at the Patent Office. He finds on further enquiry that he can only obtain admission between 10 and 4 each day. Now, for a business man, or a working man, these are the hours in which he himself is engaged. And I would suggest that, if not every evening, at least on three evenings of the week, till, say, 9 o'clock in the evening, the Library should be kept open; and it would be desirable that, say, two competent officials should be appointed to the Library possessing sufficient technical knowledge to be able to direct persons searching in the Library.

Fees on Patents.—According to the Bill introduced by the Society of Arts, the scale of Stamp Duties is as follows :—

	£	s.	d.
On application for Patent... ...	2	10	0
On Grant of Patent	5	0	0
On Certificate of renewal in fourth year of Patent	20	0	0
Ditto, Ditto, eighth year	50	0	0
On Application to amend Specification	2	10	0
On Order giving leave to amend	2	10	0
On Order prolonging Patent.—For each year of prolongation	10	0	0
On Certificate of record of notice of appeal against decision of Examiner	1	1	0
On Certificate of record of notice of opposition to any application	1	1	0

In Mr. Anderson's Bill :—

	£	s.	d.
On Petition for grant of Letters Patent		10	0
On Certificate of record of notice to proceed		10	0
On warrant of Law Officer for Letters Patent	1	0	0
On the sealing of Letters Patent	1	0	0
On the Specification	1	0	0
On Letters Patent at the end of seven years	20	0	0
On Letters Patent at the end of twelve years	40	0	0
On Letters Patent at the end of seventeen years...	40	0	0

Now, referring to these scales of fees, it will be seen for the application and grant of a Patent the Society of Arts Bill charge together £7 10s. With this amount I have no objection to raise, except that I should prefer the lower charge of Mr. Anderson, which is £4; but, as I have said before, it is contemplated to increase this amount by a small additional charge—I think about £1. It is still, however, one-third less than the Society of Arts Bill.

But what I think inventors will take exception to is the payment of the deferred duties at the fourth and eighth years respectively. Now, one of the great grievances of Inventors at present is to be called upon to pay duty at the third year. True the amount of duty according to the Society of Arts Bill is but £20 at the fourth year, but I think it would be better to adopt the period of seven years within which the duty is to be paid, as in Mr. Anderson's Bill; and instead of the eighth year, put it at the twelfth year. I may be met in this argument by the fact that Mr. Anderson intends to impose a further duty of £40 at the seventeenth year. True, but the Patent under the Society of Arts Bill expires at the seventeenth year if not prolonged. If prolonged it would certainly cost more than the £40 stipulated in Mr. Anderson's Bill to get it prolonged.

This vexed question of fees is one on which a great many Inventors disagree. Some are of opinion annual payments, as in most Continental countries, are preferable. Some that the United States scale is the best, viz., that the total charge be £7 for a seventeen years Patent.

Let me take illustrations of the fees payable in, say, France, Belgium, and Germany, where annual payments are imposed. France is a fixed sum of 100 francs per year, so that the total for the fifteen years is under £60. In Belgium the first cost is 10 francs, increasing each year by this amount, so that at the twentieth year the total would amount to about £85. Germany, commencing with £2 10s., increasing after the second year by this amount we arrive at a total of about £234 for the term of the Patent. Of course in each case the Patent lapses if the annual payment is not paid. Now, as regards United States, as stated, the total is but £7 for a seventeen years' Patent. It has very often been stated that the Patent office here could not be sustained on this small scale, but I think I have a very conclusive answer to disprove such statement in the Annual Report of the Commissioners of Patents for the United States for the year ending December 31, 1881, which I received this morning.

In that statement I find the amount received was 853,665 dols. for the year 1881, and the expenditure 605.173 dols. leaving a balance of no less than 248,492 dols. (nearly £50,000.

The number of Patents applied for were 24,878. Patents and designs issued to Citizens of the United States, 15,118; Patents to Citizens of foreign countries 995. Thus it will be seen, as the Commissioner says, "The receipts of the office during the past year exceed any previous year by more than 14 per cent. In no former year have there been so many applications for patents or so many Patents granted."

I have given these particulars so as to show that with the small charge made and the large staff at Washington, the office can be carried on in an efficient manner, and at the small charge of £7 for each Patent.

What is the case with England? In the report for 1880 I find the number of applications for Letters Patent during the year 1880 was 5,517, being 179 more than the preceding year; the results of the proceedings relating thereto are given in the table in next column.

In the year 1881, report of which is not yet issued, applications were made to the number of 5751, being 234 over 1880; so if we take the same ratio the number of applications in the States as compared with England is close upon five to one.

Suggestions.—The Act of 1852 under which Patents are now granted, was, I presume, intended to be worked, but I have no fear in asserting that that Act has not been worked in the way it was intended to be by the framers, and if with the addition of the various conditions embodied in the

Applications for Letters Patent		5,517
Letters Patent Sealed thereon	3,740	
Letters Patent void, the Patentees having neglected to file Final Specifications in pursuance thereof	67	
Letters Patent consequently remaining in force	3,573	
Of which		
Final Specifications were filed in respect of	3,460	
Complete Specifications were filed in respect of	213	
Lapsed Applications :—		
Applicants having failed to seal their Patents	1,771	
Patentees having neglected to file Final Specifications ...	67	
Applications under opposition to grant or sealing of Letters Patent	6	
		1,844
Patents remaining in force		3,673

Bill introduced by Mr. Anderson, and fees reduced to the scale, I think a good deal would be obtained. On this head I may be permitted to quote the Resolution of the Council of the Institute passed early last year, which runs thus:—

"That in the opinion of this Council, Mr. Anderson's Patent Law Amendments Bill meets the required conditions, in so far that it is a short simple measure, entailing but little change in the Act of 1852, but obtains for that Act the efficient working intended by the framers of the Bill, by the appointment of paid Commissioners, the reduction of fees, extension of Patents to twenty-one years, extension of Provisional Protection, notice before forfeiture, and other points which have been constantly advocated by the Inventors' Institute. The Council is also of opinion that the efforts of the Institute should now be directed to the obtaining recognition of the importance of their other recommendations, particularly those which tend to make Patent property more secure in its titles, since, without such security, capital will not be invested in such property, and the industrial progress of the nation will continue to be unduly retarded."

I think that resolution applies equally to the present session of Parliament, where it is, I think, evident from the state of business in the house, no elaborate measure of reform can have a chance of passing this session, and to be again placed on the shelf to be taken down, dusted, and brought up next session, will not only be a misfortune to the country, but a great loss to it. Therefore, if the Bill introduced by Mr. Anderson, or any Bill on the same lines, and specially with regard to the reduction of fees, could be passed and worked in conjunction with the present Act, I think the Government would receive from Inventors and others interested in Patents their cordial thanks, and the benefit accruing to the country at large would be very great.

As regards the facilities to Inventors to make searches, I have already put forward the proposition as to having the Library open certain evenings of the week, and to facilitate such searching the publication up to date of the books of abridgment should be pushed forward. What I refer to are those useful books of abridgment under various distinctive heads—Steam Engines, Propelling, &c. At present on many subjects no such book of abridgments exists, and where they do exist the last Patent mentioned is generally many years previous, so that what the Inventor is seeking for—Patents of recent date—it is impossible to obtain except by going through the Specifications themselves, which in several subjects entails, not only a great expenditure of time, but a vast amount of unnecessary labour, which could be overcome by bringing the abridgments up to date. Or, better still, why not adopt the German and United States policy of issuing a concise description of claims with the drawings filed. If the office can issue the Commissioner's *Journal*, surely some such publication of abridgments could be prepared and issued each week, and not left to the enterprise of the *Engineer* and *Engineering*, who issue, at considerable expense and labour, abridgments with drawings each week. Surely it is not to the credit of a Government who extract so much money out of the pockets of Inventors that we should depend upon private enterprise for that which should be supplied to the Inventor by the Government itself.

Admiral **Selwyn**, in the course of the discussion on this paper, said that although the Government had brought forward various bills, yet they were all so glaringly erroneous that the common sense of the nation had put them aside at once. With regard to the Society of Arts' Bill, as it was termed, it was to be considered that any good points it contained were originated by the Inventors' Right Bill, prepared some years ago by the Inventors' Institute (for copy see *Scientific Review*). On the other hand, objectionable matters have been introduced into the Bill, whilst no such modification of the measure as required by the great advancement of public opinion on the Inventors' question had been adopted. Mr. Morgan had very pointedly alluded thereto. He certainly considered fourth and fifth year payments—in fact, all further payments—most unadvisable and most unjust. First principles are and ought to be the sole guide in levying taxes, and those who decry taxes on the nation's bread ought not to advocate the levy of the same imposts on those who enable the nation to earn that bread. All working men, not alone inventors—indeed, every man, woman, and child in the nation—is deeply interested in this question, for by manufactures alone can the nation now pay for its food, since the time has passed when we could profitably raise it in our own country, so as to supply its increased population. With regard to the proposal to appoint technical men as commissioners, they would be utterly useless as soon as they ceased to practise their technicalities, and they never could be judges of the novelties introduced more often not by them but by outsiders. The false idea of raising a tax on invention has led both lawyers and statesmen astray. The arrears of work at the Patent Office is a money question—put on a larger staff till work is posted up—and as there is a large surplus of Patent Office fund, this ought to be no difficulty. As regards the cost of patents, England should have three times as many patents as the United States. This would, with similar arrangements, make a sum of £853,665 annually, instead of £250,000.

Mr. **Campin** (the Secretary), in order to lead off discussion, remarked that when he first began to agitate for Patent Reform, he did so knowing well that working men and others with very little in their pockets required as a *sine qua non* a very cheap initial stage, or provisional protection, or entry for one shilling if possible, and he still held to this idea, so much so that unless some such arrangement as Mr. Anderson proposed be adopted, Patent Law Reform would still be a thing of the future. With regard to after payments he would not say much. Of course, we were all agreed that nothing beyond office expenses be charged; but looking at the Commissioners, Corps of Examiners, &c., which everybody considered desirable, he would not peril common sense financering by stating the necessary charge in its entirety for a patent. His own notion was that proper books of abridgment, good library arrangements, &c., would enable inventors to search into the novelty of their inventions for themselves, and so save the expense of an extravagant examining staff. The other points of Patent Law had been so often dilated upon by the Institute that he would not occupy time in discussing them; but certainly the Society of Arts Bill was most aptly referred to by Admiral Selwyn.

Mr. **Stansfield** made some general remarks on the inventors' cause, wherein he showed how the inventor was the great civiliser, all that had been done to feed, clothe, and advance the country being due thereto. He advocated £5 as the cost of the patent, which would be amply sufficient to meet all expenses; it should be paid down at once and no after payment should be required.

Mr. T. **Paterson** made some remarks substantially in accordance with Mr. Campin's views. And after some remarks by Mr. **McWilliam**, Mr. **McLauchlan**, and other gentlemen, a vote of thanks to Mr. Morgan for his paper was duly passed, to which he replied, and the Chairman having been thanked for presiding, the meeting ended.

NEW APPARATUS FOR THE DETERMINATION OF MELTING POINTS.

By C. F. Cross and E. J. Bevan.

The apparatus consists of a small platform of thin ferrotype iron or silver, having an opening for the reception of a thermometer bulb and a small indentation or depression about 1·5 m.m. deep and 2 m.m. in diameter. A very small quantity of the substance is melted in the little depression, and while still liquid a thin platinum wire, bent like an L and fused into a glass float, is immersed in the liquid and held there until the substance solidifies. A thermometer is then inserted in the opening, and the whole apparatus plunged under mercury. The mercury is gently heated, and the thermometer carefully watched. As soon as the substance melts the float rises instantly, and the temperature is noted. Stirring is unnecessary, the whole of the substance is surrounded with mercury, and the attention can be concentrated on the thermometer.

Harrow.—Mr. Thomas Haxton, of Gore, Otago, New Zealand, has patented an improved harrow, which is constructed of sections of metal, each section made in one piece, bent horizontally in triangular form, with eyes at the ends of the arms, and also bent vertically below the eyes to form teeth, whereby, when the sections are linked together, a complete flexible harrow is made.

Wood-graining.—Mr. Benjamin C. Smith, of Searsport, Me., has patented an improved apparatus for transferring wood-graining; also applicable to transferring any desired design formed by engraving or otherwise upon a plate or block of wood or other material. By this invention the natural graining of wood may be transferred to any desired surface, without applying the colour by which the transfer is made to the pattern, so that the depressions of said pattern can never become filled, and the pattern be used an indefinite number of times. The pattern, which should be a distinctly grained piece of wood, is fixedly supported upon a block or carrier, having at its opposite ends rollers, one of which is pressed outward by a spring for the purpose of keeping a band, arranged to pass round said rollers, taut. This endless band may be of rubber-coated cloth, and it is made to travel over the pattern, so that on colour being applied by a brush to the outer surface of the band, and a rubber presser being made to bear the latter down on the pattern, the colour will be removed from the raised surfaces of the band, and a copy of the graining of the pattern in colour will be left on the band. The device at one of its roller ends is then placed against the surface to which the graining is to be transferred, and the block or carrier moved over said surface.

Proceedings of Societies.

ROYAL SOCIETY.

Feb. 16.—The President in the chair.—The following papers were read:—"On Impact with a Liquid Surface," by Mr. A. M. Worthington,—"The Minute Anatomy of the Thymus," by Dr. H. Watney,—"On the Influence of the Galvanic Current on the Excitability of the Motor Nerves of Man," by Dr. A. Waller and Mr. A. de Watteville,—and "On the Excretion of Nitrogen by the Skin," by Dr. B. Power.

March 16.—The President in the chair.—The Duke of Edinburgh was elected a Fellow.—The following papers were read: "Sur les Centres de Courbure principaux des Surfaces Homofocales du Second Ordre," by Lieut.Col. A. Mannheim,—"Note on the Photographic Spectrum of the Great Nebula in Orion," by Mr. M. Huggins,—and "On the Disappearance of some Spectral Lines, and the Variations of Metallic Spectra due to Mixed Vapours," by Profs. Liveing and Dewar.

ANTROPOLOGICAL INSTITUTE.

Jan. 24.—Anniversary Meeting.—Major-General Pitt-Rivers, President in the chair.—The following gentlemen were elected Officers and Council for the year 1882:—President, Major-General Pitt-Rivers: Vice-Presidents, Hyde Clarke, Dr. J. Evans, Prof. W. H. Flower, F. Galton, Dr. A. Thomson, and Dr. E. B. Tylor; Director, F. W. Rudler; Treasurer, F. G. H. Price; Council, Lieut.-Col. H. H. Godwin Austen, Dr. J. Beddoe, S. E. B. Bouverie-Pusey, E. W. Brabrook, Prof. G. Busk, C. H. E. Carmichael, W. B. Dawkins, W. L. Distant, A. W. Franks, Prof. Huxley, A. H. Keane, A. L. Lewis, Sir J. Lubbock, Bart., R. B. Martin, J. E. Price, Lord A. Russell, A. Tyler, C. S. Wake, M. J. Walhouse, and R. Worsley.—The President delivered his annual address, in which he reviewed the work of the past year.

Feb. 7.—Mr. F. G. H. Price, President, in the chair.—It was announced that the following new Members had been elected since the last meeting:—Mrs. R. M. Connolly, Mrs. T. Dixon, Miss Marshall, Dr. B. Casement, Messrs. F. T. Hall, R. M. Connolly, F. Dixon, W. K. Foster, and T. Ridgway.—Mrs. E. C. Hore read a paper "On the Twelve Tribes of Tanganyika."—Mr. G. W. Bloxam read a note "On a Patagonian Skull brought from Carmen, at the Mouth of the Rio Negro (lat. 44°)," by Captain Hairby. -- The Assistant-Secretary read "Notes on the Napo Indians," by Mr. A. Simson.

March 21.—General Pitt-Rivers, F.R.S., President, in the chair.—It was announced that the following gentlemen had been elected members of the Institute:—Francis Archer, Esq, W. A. L. Fox Pitt, Esq., and W. E. Maxwell, Esq.—Mr. Worthington G. Smith, F.L.S., exhibited some Palæolittine flint implements from Hackney Brook.—General Pitt-Rivers exhibited a collection of specimens illustrating the distribution and varieties of a padlock.—Mr. A. L. Lewis read a paper "On the relation of Stone Circles to Outlying Stones or Tumuli or Neighbouring Hills."—Mr. J. S. Price, F.S.A., read a paper by himself and Mr. F. G. Hilton Price, F.S.A., "On Excavations of Tumuli on the Brading Downs, Isle of Wight."

April 4. — Major-General Pitt-Rivers, F.R.S., President, in the chair.—The election of Everard Finn Thurn, Esq., was announced.—The President exhibited some masks and wood carvings from New Ireland.—Mr. C. Staniland Wake read a paper "On the Papuans and the Polynesians.—A paper was read by Mr. C. Pfounds "On Rites and Customs in Old Japan."

SHORTHAND SOCIETY.

Feb. 7.—Mr. C. Walford, President, in the chair.—Six new Members were elected, Messrs. Anders, G. H. Fenn, Kingsbury, A. Paterson, H. W. Wheeler, and H. F. Wood.—The Chairman announced that the Society had acquired the quarterly magazine *Shorthand*, which would be used as the organ of the Society, under the editorship of two members of the Council.—Dr. Westby-Gibson exhibited a copy of Junius's Letters published in 1771, said to have been Horne Tooke's copy. It contains a great number of brief notes in shorthand and cryptography, which hitherto have baffled the skill of decipherers. Dr. Westby-Gibson has mastered the enigma, and finds that the notes are Latin and English words and phrases written in an old stenographic system, varied at times for greater secrecy, and sometimes mixed with cryptograms. The book was given by Horne Tooke to the father of Mr. Y. Brown, the present Consul-General of Genoa, who forwarded it to Mr. Bent, author of the "Rise and Fall of the Republic of Genoa," and this latter gentleman permitted Dr. Westby-Gibson to exhibit it.—Mr. J. R. Rundell, author of "Civil Service Shorthand," read a paper on the nine vowel-positions he had adopted in that system, advocating it as an improvement on Mr. Pitman's "Phonography."—A discussion followed, the general opinion being that "position" ought to be used in any system as sparingly as possible.

ZOOLOGICAL SOCIETY.

Feb. 7.—Prof. W. H. Flower, President, in the chair.—Mr. H. Seebohm made remarks on a series of goldfinders (obtained at Krasnoyarsk, in Central Asia) when presented every form of transition between *Carduelis major and Carduelis acniceps*.—The Secretary exhibited two hybrid ducks, obtained on some ornamental water near Darlington.—Papers were read by Mr. Saint George Mivart, on the classification and distribution of the Æluroidea. He regarded this sub-order as best divisible into three families, (1) Felidæ, (2) Viverridæ, (3) Hyænidæ. The Felidæ he proposed to sub-divide into but two genera, Felis and Cynælurus; the Viverridæ into five sub-families, (1) Viverrinæ, (2) Galidictinæ (3) Euplerinæ, (4) Cryptoproctinæ, and (5) Herpestinæ. The Hyænidæ were referred to two sub-families, (1) Protelinæ and (2) Hyoninæ. The author regarded Cryptoprocta as a true viverrine animal, attaching but little importance to dental characters save as discriminating species and genera. The Galidictrinæ were arranged to include the genera Galidictis, Galidia, and Hemigalidia, the last-named genus having been instituted for the species previously known as *Galidia olivacea* and *Galidia concolor*,—by Mr. W. A. Forbes, on some points in the anatomy of the Indian darter (*Plotus melanogaster*), and especially on the mechanism of the neck in this genus in connection with the habits of the birds,—from Prof. P. M. Duncan, on some recent corals collected by Mr. J. Y. Johnson, at a few fathoms' depth, in the sea off Funchal, Madeira,—and by Mr. S. O. Ridley, on the arrangement of the Coralliidæ.

NEW SHAKESPERE.

Feb. 10.—Mr. F. J. Furnivall in the chair.—Rev. M. W. Mayow read a paper "On Hamlet's 'Speech of some dozen or sixteen lines.'"—Dr. F. Landmann read a paper "On Shakspere and Euphuism: Euphuism an Adaptation of the Spanish Guevara," showing that the affectations ridiculed by Shakspeare in "Love's Labour's Lost" were none of them euphuisms, but came from Italy, whereas euphuism came from Spain, Lyly's Euphues being directly taken from Guevara's writings.

ASIATIC SOCIETY.

Feb. 20.—Sir E. Colebrooke, Bart., President, in the chair.—The Rev. W. Wilson and Messrs. A. W. Macdonnell and E. Macarthy were elected Resident Members; and the Right Hon. Sir A. H. Layard, Messrs. G. McCorkell and K. T. Best, and the Rev. Mr. Bruce non-Resident Members.—The Rev. Mr. Schön read a paper "Upon the Hausa Language," the *lingua franca* of Western Africa, of which he has published a grammar and a dictionary, texts and translations of the Holy Scriptures, having acquired his knowledge during a long residence in that part of Africa.—Mr. R. N. Cust followed with a paper "On African Scholars." Dividing Africa into three regions, each containing two distinct groups of languages, he went over the long roll-call of the names of those who had contributed to the knowledge of one or more of the scores of languages spoken on that continent, all of which are unwritten. He remarked that but a small portion of the work which had to be done had been as yet accomplished, and that till this was done it was of no use to discuss the question of the origin of languages.

March 20.—Sir E. Colebrooke, Bart., President, in the chair.—The Duke of Buckingham, the Marquis of Hartington, the Earl of Crawford and Balcarres, the Lady A. I. Blunt, Mr. W. S. Blunt, and Dr. T. Wise were elected as Resident Members; and Col. Cadell, Lieut.-Col. Prideaux, Messrs. Hormuzd Rassam, W. Dupuis, G. Hughes, and C. Pownall Non-Resident Members.—Dr. R. G. Latham read a paper "On the Date and Personality of Priyadarsi"—an amended form of a paper with the same title read before the Asiatic Society by him twenty-three years ago, and published in the Society's *Journal* for 1860. The argument of this paper was that Priyadarsi was contemporary with several kings or magnates with whom he made various compacts, viz., one in the tenth and another in the twelfth year of his reign. With four rulers—viz., Ptolemy, Alexander, Antigonus, and Magas—he appears to have made supplementary compacts in the twenty-seventh year of his rule.—Mr. A. Lille read a paper "On Buddhist Saint-Worship, in which he pointed out that there were really two Buddhisms or forms of Buddhism, one of which proclaimed the annihilation of the saint or Buddha at his death, while the other supported the Buddhism of the rituals, with temples where the dead saints were invoked and asked to forgive sins, &c. Representations of the latter form are, he thought, sufficiently apparent on the well known sculptures from Amravati and Bhurhut.

SOCIETY OF ANTIQUARIES

Feb. 16.—Mr. E. Freshfield, V.P., in the chair.—Mr. B. Hull exhibited, through Dr. C. S. Perceval, a small MS. volume, bound in red morocco, and entitled "A List of his Majesty's Navie Royall, with their Dimensions, Number of Men, and Gunns." The date of the book was 1660, the year in which Pepys was appointed Clerk in the Acts of the Navy. The sides of the book bore the name of Eduardus Dering, to which had been added later the title of Mercator Regius. It appears from the "Calendar of State Papers" (Car. II., Domestic, 1660-1661) than an Edward Dering was appointed to the office of King's Merchant in the East for buying and providing necessaries for apparelling the navy."—The Rev. Canon Pownall, by permission of Mr. H. Rodgers, exhibited a gold ring found at Gilmorton, and bearing the words "The King's Gift" and the initials I. B.—Mr. J. Evans suggested it might have been made out of a royal touchpiece in the time of James I.—Mr. J. E. Nightingale exhibited a bronze heater-shaped seal of Vilhem Pelhisier (probably Palliser), dug up in Wyndham's Park, Salisbury.—Mr. E. Peacock communicated some notes on the uncouth names given by the Puritans to their children.—Sir H. Dryden laid before the Society an account of the remains found at a burial-place on Marston Hill, co. Northampton. This was intended to supply some omissions in the account of those remains published in the *Archæologica*. vol. xxxiii.

March 16.—The Earl of Carnarvon, President, in the chair.—A letter from the Home Secretary was read in acknowledgment of the duplicate copy of the address to the Queen, which, according to usage, had been sent to the Home Office.—The Chevalier de Reichel exhibited a portion of the Hasselman collection of illuminated initial letters which had been cut out of MSS. and books—a barbarous proceeding, now, we trust, no longer in vogue; also a Book of Hours, by Kerver (date *circa* 1505), and a service book of Compline.—Mr. J. Evans exhibited a gold ring found in Sussex, and bearing the following inscription in relief (St. John xviii. p. 8):—"Ciergo me queritis cinate eos baute [*sic*]." The last word Mr. Evans considered to be probably intended for the "abire" of the Vulgate. Was the inscription selected as a charm?—Mr. D. G. C. Elwes exhibited a small oval bronze seal of the fourteenth century, found near St. John's Church, Bedford. It bore the Agnus Dei with the usual inscription. Mr. Ewes conjectured it might have belonged to one of the masters of St. John's Hospital, founded at Bedford.—Mr. G. L. Gower exhibited an urn and a small armilla with exquisitely delicate patina, found at Godstone, Surrey, for which county Mr. Leveson Gower is local secretary.—Mr. J. D. Leader communicated an account of a careful restoration now being carried on in the Shrewsbury Chapel in St. Peter's Church, Sheffield, on the tomb of George Talbot, fourth Earl of Shrewsbury.—Mr. R. S. Ferguson exhibited four cups or chalices from the north of England. It was obvious that two of these vessels with high covers, though undoubtedly used as chalices for many years, could never have been made for that purpose. One of the chalices proper bore the closest resemblance to the Nettlecombe chalice figured in the *Archæologia*, and must have been made *circa* 1559.—Mr. J. Parker communicated an account of the Hospital of St. John the Baptist at Chipping Wycombe, together with illustrations of the existing Norman remains. These remains are threatened with destruction, the Charity Commissioners having refused, on financial grounds, to sanction a scheme by which the governing body had hoped to incorporate and so to preserve them in the new school buildings. It is, therefore, all the more important that careful drawings and plans should be preserved of such interesting specimens of early architecture. If these remains are destroyed it ought to be remembered that the blame will not rest with the governing body of the school, whose wishes have been thwarted by the Charity Commissioners, who in their turn are, no doubt, actuated by a sense of public duty.

ROYAL SOCIETY OF LITERATURE.

Feb. 15.—Mr. J. Haynes in the chair.—Mr. Fleay read a paper "On Homer and Comparative Mythology," in which he maintained that, although the fundamental principles of comparative mythology were now firmly established, the application of these principles, as made by Prof. Max Müller, Sir G. Cox, Kuhn, and others, had led to numerous contradictions and absurdities. This, he said, arose from each mythologist identifying his own view with the powers of nature, the sun, the dawn, or the storm, and with many deities who had distinct and independent functions. Mr. Fleay then gave in detail his own interpretation of the chief deities of the "Rig Veda" and of Homer, and pointed out the interpretation which would be necessary, on his hypothesis, for a large number of Myths, including those of the Iliad and Odyssey.

BRITISH ARCHÆOLOGICAL ASSOCIATION.

Feb. 15.—Rev. S. M. Mayhew in the chair.—Major di Cesnola exhibited a collection of gold articles found in Cyprus, for the most part at Salaminia.—Among the other foreign exhibits was an interesting scarab exhibited by Mr. C. Sherborn, of late Egyptian style, which was described by Mr. W. de Gray Birch.—A portrait of Milton, supposed to have been painted at an early period of the poet's life, was described by Mr. E. Walford: the head is laureated.—Mr. W. G. Smith exhibited a glass muller-like object used in the straw manufacture of Dunstable, but similar in form to many objects of the same material frequently found in London. Mr. Loftus Brock described various ancient articles of pottery from London Wall; and Mr. T. Wright exhibited a fine *couteau de chasse*, ornamented with the feathers of the Prince of Wales, which is said to have belonged to Owen Glendour. It is, however, of the early part of the seventeenth century. The first paper was by Dr. Phené, on recent explorations and excavations made by the author in Scotland. After directing attention to the legends of the great worm or serpent of Wormiston, which was said to have coiled itself on the base of the remarkable terraced hill there, the lecturer passed in review the extraordinary mounds of artificial formation which exist in various parts of the world having the shape of a serpent clearly defined. The last of these mounds which had come under his notice was excavated at a point which he indicated, and traces of burning and charcoal were found precisely as in others of the same description. The paper was illustrated by a large series of diagrams and views.—The second paper was by the Rev. Mr. Lach-Szyrma, and was descriptive of St. Hilary Churchyard, Cornwall, where monuments of the Roman and Celtic periods are to be met with, which, with the old tower of the church, attest the continuance of Christianity in the district probably from the fourth or fifth century.

March 15.—Mr. T. Morgan in the chair.—The progress of the arrangements of the Congress was detailed.—Mr. L. Brock described the remains of Old Ludgate which have been recently brought to light by the setting back of the houses on Ludgate Hill. A portion of the east wall is visible opposite the front of St. Martin's, Ludgate.—Sir Talbot Baker sent for exhibition two archaic-looking objects of terra-cotta found near Weymouth, which were pronounced to be grinders, most probably for corn.—Mr. C. Brent gave further particulars of the Roman villa at Methwold, and a plan of the remains, prepared by the Rev. Denny Gedge, was exhibited.—An elaborate paper on the cup and ring markings on stones at Ilkley, by Mr. J. R. Allen, was read, in the absence of the author, by Mr. W. de Gray Birch. These markings are found on many of the moorstones, sometimes on the top, but more frequently on the sides, one of the most curious of the groups being on the "Pancake" Rock, on Rumbold's Moor, a high ridge 1,010 feet above the sea-level. Thirteen hollowed cup-markings are found on it, enclosed with a connecting ring. Another group is on a stone at the foot of Green Crag, another on Weary Hill, and others on Riper's Crag.—An animated discussion followed, and Mr. J. Brent suggested that the markings were plans of tribal interments, while it was suggested by the Chairman that they were plans of the tribal settlements themselves. Mr. Loftus Brock pointed out, in support of this latter view, their resemblance to plans of dwelling places on Dartmoor figured by Sir Gardner Wilkinson. Several of the speakers referred the continuance of these markings to a comparatively late date, a stone similarly marked having been found within a dwelling at Birtley, with a coin of Valentinian and an iron sword, while other markings are found on the walls of brick churches in Germany.—The second paper was by the Rev. Dr. Hooppell, on an early church at North Gosforth, near Newcastle-on-Tyne. This is a ruined building, but the plan is perfect, showing a small nave with a square-ended chancel and a very small chancel arch, the whole being of small dimensions. The walls are constructed entirely of stones from some Roman building, and are surrounded externaliy by a chamfered plinth. The date appears to he late Saxon.

NUMISMATIC SOCIETY.

Feb. 16.—Mr. W. S. W. Vaux, V.P., in the chair.—Messrs. W. J. Andrew, J. Ashtell, J. E. Backhouse, E. Leggett, and C. W. Owman were elected Members; and the name of M. G. Schlumberger, an Honorary Member, was added to the list of the Ordinary Members.—Canon Pownall exhibited an impression of an Irish Waterford halfpenny of King John, now in the library of the Royal Society of Antiquaries, Dublin, and believed to be unique. This coin has on the reverse the cross pommé instead of the ordinary cross, a fact which tends to confirm the attribution to John of the coins with the cross pommé, of the short cross class, in the English series.—M. Terrien de La Couperie contributed a paper on the silver coinage of Tibet, in which he showed how Nepal and China have always provided for the wants of Tibet in the matter of coinage, and that the influence of the coinage of those countries may be traced upon the money of Tibet even when it was struck within the Tibetan frontiers. In illustration of his remarks M. de La Couperie exhibited impressions of Nepalese coins discovered in Tibet by the Abbé Huc and by him presented to the Bibliothèque Nationale in 1847; also photographs of the coins of Tibet in the British Museum and India Office collections, consisting of the following varieties: Tibetan, of the date 1772; Tibeto-Nepalese, 1788-92; and Tibeto-Chinese, 1793-1822.

March 16.—Dr. J. Evans, President, in the chair.—Mr. H. Montagu exhibited some half-crowns of Edward VI. and crowns of Charles I. and Cromwell in remarkably fine preservation; also a counterfeit sterling struck by John of Hainault, found at Worsted in Norfolk.—Mr. Evans read a paper on a hoard of early Anglo-Saxon coins found near Delgany, co. Wicklow, in 1874, consisting of silver pennies of Eadbearht, Cuthred, and Baldred, Kings of Kent, A.D. 794-823; of Offa, Coenwulf, Coelwulf, and Beornwulf, kings of Mercia, 757-824; of Egbert, sole monarch; of various Archbishops of Canterbury; and of one coin of Pope Leo III., 795-816. The writer remarked that this was the most essentially Kentish hoard of which we have any record, a large proportion even of the coins of the kings of Mercia bearing evidence of having been minted at Canterbury. With regard to the question how these Kentish coins found their way to Ireland, Mr. Evans said that in all probability they formed part of the spoil of a band of marauding Danes, who, after ravaging the Isle of Sheppey in the year 832, transported their plunder to Ireland. "Danes, pagans, or heathens" are said to have first settled in Ireland in 795, and by 853 they had already founded royal dynasties in Dublin, Waterford, and Limerick. The fact that hardly any Anglo-Saxon coins of this early date have been found in Scandinavia, whereas in Ireland they are of frequent occurrence, led Mr. Evans to infer that most of the early Danish invasions of Britain, including this one of the Isle of Sheppey, were made by Western Danes from their Irish settlements, this view being corroborated by the circumstance that these early Danish expeditions were mostly directed against the western and southern coasts of Britain, and not against the eastern or northern.—A discussion followed, in the course of which Mr. Vaux remarked that the Irish *provenance* of these Kentish coins shed an entirely new light on the early history of England.—Mr. B. V. Head concurred with Mr. Evans in his attribution of the Papal coin found with this hard to Leo III. rather than to Leo VIII., to whose pontificate the few coins known of this type have been hitherto classed.—Mrs. Bagnall-Oakeley communicated a paper on the hoards of Roman coins which have been from time to time discovered in the Forest of Dean, Gloucestershire, chiefly in the vicinity of ancient iron mines, the coins having been, perhaps, intended for the payment of the miners' wages.—Mr. Stanley Lane-Poole communicuted a letter which he had received from M. H. Sauvaire on some rare or inedited Oriental coins in the collection of M. Ch. de l'Ecluse.

CHEMICAL SOCIETY.

Feb. 16.—Prof. Roscoe, President, in the chair.—It was announced that the Council proposed Dr. Gilbert as the President for the coming year; Dr. Schunck and Mr. Griess as Vice-Presidents; Drs. Atkinson and Japp, Captain Abney, and Mr. O'Sullivan as Members of the Council, instead of Dr. Tidy and Messrs. Carteighe, Roberts, and Warington.—The following papers were read:—"On Benzylphenol and its derivatives," Part II., by Mr. E. Rennie. The author has obtained and studied the following derivations: benzylphenol sulphonic acid, mononitrobenzylphenol, amido-benzylphenol, dinitrobenzylphenol, nitro-bromo-benzylphenol. The same nitrobromo derivative is obtained whether nitric acid acts on the potassium bromosulphonate or bromine acts on the potassium nitrosulphonate. The formulæ of these substances must, therefore, be symmetrical. Benzylphenol is, therefore, a para derivative. The author quotes other evidence in support of this view.—"On the Buxton Thermal Water," by Mr. J. C. Thresh.—"On Retrograde Phosphates," by Mr. F. J. Lloyd.—"Contributions to the Knowledge of the Composition of Alloys and Metal Work, for the most part Ancient," by Mr. W. Flight. This paper contains analyses of some copper nickel coins of Bactria; some coins of ancient India, about 500 B.C., containing silver, copper, lead, &c.; a figure of Buddha containing four per cent. of silver chloride; "Bidrai" ware and "Koft Gari" work from India; some iron and bronze implements from the Great Pyramid; copper spear-heads from Cyprus; a Hebrew shekel; various old Roman bronzes, &c.—"On the Dissociation of Chlorine," by Messrs. A. P. Smith and W. B. Lowe.

March 16.—Prof. Roscoe, President, in the chair.—The following papers were read: "On Valency," by Dr. Armstrong. The bulk of this paper is taken up with a consideration of the valency of carbon in the hydrocarbons, and especially with the formulæ proposed by Kekule and others for benzene. The author concludes that a simple hexagon, in which carbon acts practically as a triad, agrees best with the various reactions of benzene.—"Contributions to the Chemical History of the Aromatic Derivatives of Methane," by Mr. R. Meldola. The author investigates the action of benzyl chloride upon diphenylamine, and the action of oxidising agents upon the product. The substance thus produced is a green dye, "viridin," which by the action of strong sulphuric acid forms sulphuric acids. The alkaline salts of one of these acids dye woollen fabrics from an alkaline bath. This colour is the chloride of a base which the author has proved to be diphenyldiamidotriphenylcarbinol.—"On some Constituents of Resin Spirit," by Mr. G. H. Morris. The lower fractions of resin spirit yield on standing a crystalline substance. This body has been examined by the author; it has the formula $C_7H_{14}O_2H_2O$; it is formed from a hydrocarbon, heptin C_7H_{12}, boiling at 103°-104°, contained in resin spirit. The author has also studied the action of nitric acid, permanganate, &c., on heptin.—"On Pentathionic Acid," by Mr. W. Smith and Mr. T. Takamatsu. The author's reply to criticisms advanced by Lewes, Spring, Curtius, &c., on their previous work, and give further experiments on the subject.—"On the Preparation of Diethylnaphthylamine, and the Action thereon of Sulphuric Acid at High Temperature and of Phosgene Gas, by Mr. B. E. Smith.

PHILOLOGICAL SOCIETY.

Feb. 17.—Mr. H. Sweet, V.P., in the chair.—Mr. Cayley read a paper "On Greek Pronunciation, and the Distribution of the Greek Accent." He tried to trace a revolution in the Greek sounds to the vast extension of the language under the Macedonian kings, and later to large bodies of migratory Jews and Syrians who formed the nuclei of the Christian Churches. As to accents, Mr. Cayley thought that those which are placed nearer the end than need be tended to emphasize the whole word, and to show that it had a more important or definite meaning.—Mr. B. Dawson read some "Notes on Translations of the New Testament." He contended that the Revised Version had not always selected the best translation; that in their slavish imitation of the Greek text the revisers had often removed some of Tyndale's good idiomatic English phrases, and substituted for them others having a foreign ring about them; and that (if there could possibly be any one who desired a literal translation) the Revised Version might easily be made still more literal without damaging its style.

METEOROLOGICAL SOCIETY.

Feb. 15.—Mr. J. K. Laughton, President, in the chair.—The following gentlemen were elected Fellows: Dr. G. Oliver, Messrs. W. Aronsberg, W. G. Birchley, J. R. Capron, P. Crowley, W. W. Culcheth, D. Cunningham, S. Cushing, W. N. Greenwood, E. Kitto, J. Mansergh, H. S. H. Shaw, G. W. Stevenson, and W. H. Tyndall.—The papers were read: "Notes of experiments on the Distribution of Pressure upon Flat Surfaces Perpendicularly Exposed to the Wind," by Messrs. C. E. Burton and R. H. Curtis,—"The Principle of New Zealand Weather Forecasts," by Commander R. A. Edwin,—and "The High Atmospheric Pressure of the Middle of January, 1882,' by Mr. H. S. Wallis.—The electrical thermometer lent by Messrs. Siemens Brothers for observing the temperature of the air at the summit of Boston Church tower was exhibited.

SOCIETY OF ARTS.

Feb. 17.—Mr A. J. Balfour, M.P., in the chair.—A paper "On the Depreciation of Silver as it affects India was read before the Indian Section by Mr. J. M. Maclean.

Feb. 20.—Sir F. Bramwell in the chair.—Capt. Abney delivered the concluding lecture of his course of Cantor Lectures "On Recent Advances in Photography."

Feb. 22.—Lord A. S. Churchill in the chair.—Twelve candidates were proposed for election.—A paper "On the Production and Use of Gas for Purposes of Heating and Motive Power" was read by Mr. J. E. Dowson.

HISTORICAL SOCIETY.

Feb 16.—The Right Hon. Lord Aberdare, President, in the chair.—The following gentlemen were elected Fellows: Messrs. J. P. Taylor, A. Cochrane, J. R. V. Marchant, and T. Hockley.—The following papers were read: "Fortresses and Castles of South Arabia according to the Ilkil of Hamdani," by Dr. G. G. Zerffi,—and "Innocent I. and the Siege of Rome by Alaric," by Rev. W. Dawson.

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RECENT AMERICAN AND FOREIGN PATENTS.

Valves.—Mr. Louis C. Lugmayr, of Water Valley, Miss., has patented an improved valve-operating mechanism. The invention consists in a slide block connected with the eccentric and valve rod and carried by a guide pivoted to swing for shifting the valve.

Violin.—Mr. Nicholas B. Dennys, of Singapore, Straits Settlements, has patented a violin, which, though plainly audible to the player, cannot be heard at a short distance, thus enabling amateurs and learners to practice without inconvenience to others.

Fire-Kindler.—Mr. Edwin E. Glaskin, of Lower Cape, N.B., Canada, has patented an improved fire-kindling block composed of 5 parts sawdust, 1 part resin, and 1-16th part oil mixed together and densely compacted, so that the block is hard and non-friable.

Treating Hides.—Mr. William H. Metcalf, of Brooklyn, N.Y., has patented a process of treating hide in the manufacture of counter-stiffeners. The object of this invention is to render hide counters waterproof, so that they shall retain their rigidity under all circumstances. The process consists in saturating with a solution of benzine, paraffine, and drying oil.

Drop-light Chandeliers have been constructed with a central drop-light; but with this construction the central parts of the chandelier are scorched and defaced by the heat rising from the central drop-light, Mr. John Trigge, of New York city, has patented an improved drop light chandelier in which this defect is avoided.

Polarised Armatures.—Mr. George S. Moler, of Ithaca, N. Y., has patented an improvement in call instruments for telegraph lines, the object of which is to allow calling of any one station on the line, and at the same time indicate at all stations that the line is in use. The invention consists in polarised armatures and ratchet mechanism combined with the call bell for setting the instrument and selecting the bell to be rung.

Spittoon.—Mr. Otto Mossberger, of Guttenburg, N. J., has patented a spittoon provided with swinging covers to obstruct from view the contents. The invention consists in blocks sliding vertically in guides on the spittoon, and having foot levers connected by cords with arms of the pivoted covers, so that the covers can be raised or swung open by pressing one of the foot levers.

Car Couplings.—Mr. W. L. Davis, of South Amboy, N. J., has patented an improved car coupling apparatus with a bumper head made open at top and bottom, and having a hook connected with the inner parts of its sides by a pin; with this pin is also connected sliding bars or the sides of a link for turning the connecting pin to raise and lower the hook, and connected at their outer ends by a pin to adapt them to serve also as a coupling link.

A novel hay and straw burner has been patented by Messrs. Martin B. Parker and Richard W. Richards, of Blue Earth City, Minn. In this device the fuel can be compressed while being burned, and a draught space kept open all around the said fuel.

Chairs in which the rockers, legs, arms, back, and seat are so arranged with relation to each other that they may be folded together, when not in use, so as to occupy less space, and be easily transported, either singly or in quantities for shipping, has been patented by Mr. William H. Gifford, of Poughkeepsie, N. Y.